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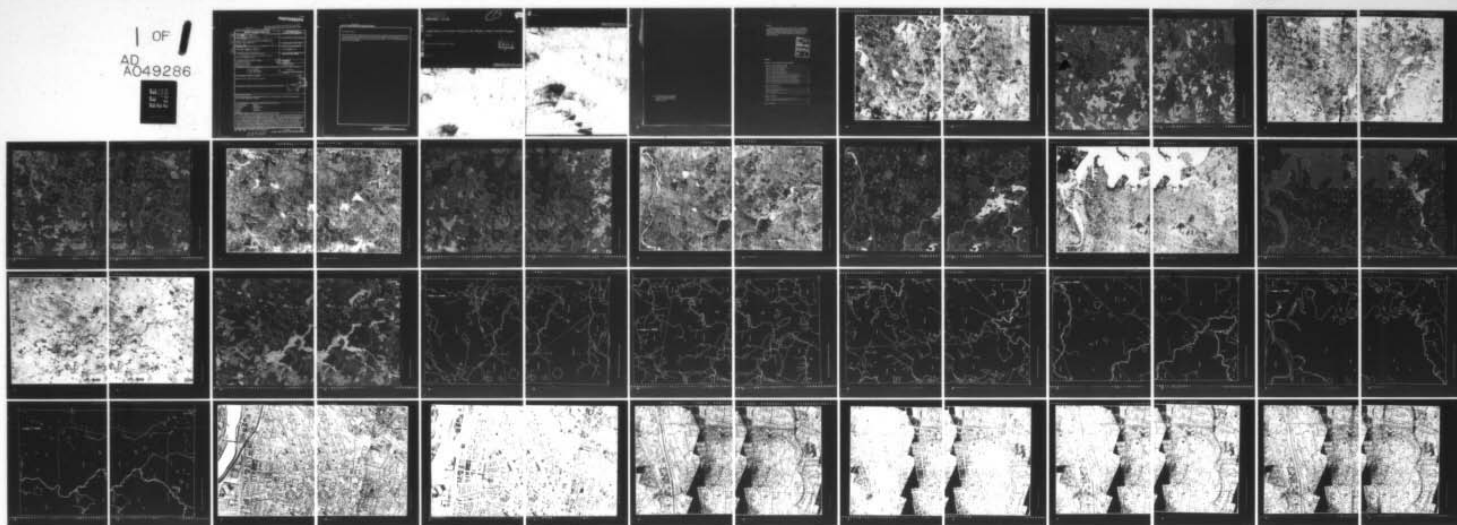
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APPLICATIONS OF REMOTE SENSING IN THE BOSTON URBAN STUDIES PROG--ETC(U)
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19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Aerial photography Mapping Environments Remote detectors Hydrology Utilization Images Water quality Land areas		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The cost effectiveness of remote sensing techniques was compared to that of the conventional techniques used by the U.S. Army Engineer Division, New England, in the Boston Harbor - Eastern Massachusetts Metropolitan Area study. A total of 6 level I, 18 level II, and 18 level III land use categories were mapped from NASA RB-57/RC-8 high altitude aircraft photography for six selected 7½-minute quadrangles located in the Boston area. Watershed and political boundaries could not be mapped from the NASA photography. Impervious surfaces and curb lengths were mapped from low altitude aircraft photography obtained with a Zeiss RMK 15/23 camera system (measured scale 1:3500) for two sites in the Boston South and Newton quadrangles. The remote sensing procedures used in this study usually provided much greater detail than conventional procedures. The remote sensing procedures were not		

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20. Abstract (cont'd)

always cost-effective when compared to the conventional procedures, but they were always more accurate. Therefore, remote sensing techniques should be used and appropriate photographic resolution and scale factors taken into consideration when mapping land use, curb density and impervious surfaces for use in the STORM (storage, treatment, overflow, runoff) model.

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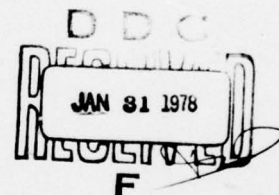
REPORT 77-13



Applications of remote sensing in the Boston Urban Studies Program

Part II

Carolyn J. Merry and Harlan L. McKim



June 1977

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*Cover: Satellite photograph of eastern Massachusetts
with the study area outlined. (NASA photo-
graph taken on 21 September 1973 during
the Skylab-3 mission.)*

PREFACE

This report contains Appendices A, B and C of CRREL Report 77-13, *Applications of Remote Sensing in the Boston Urban Studies Program*. The land use maps (Appendix A) contained in this report have been slightly reduced from the original scale of 1:24,000. The bar scale on these maps can be used for scale purposes. The original land use maps can be viewed at the U.S. Army Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire.

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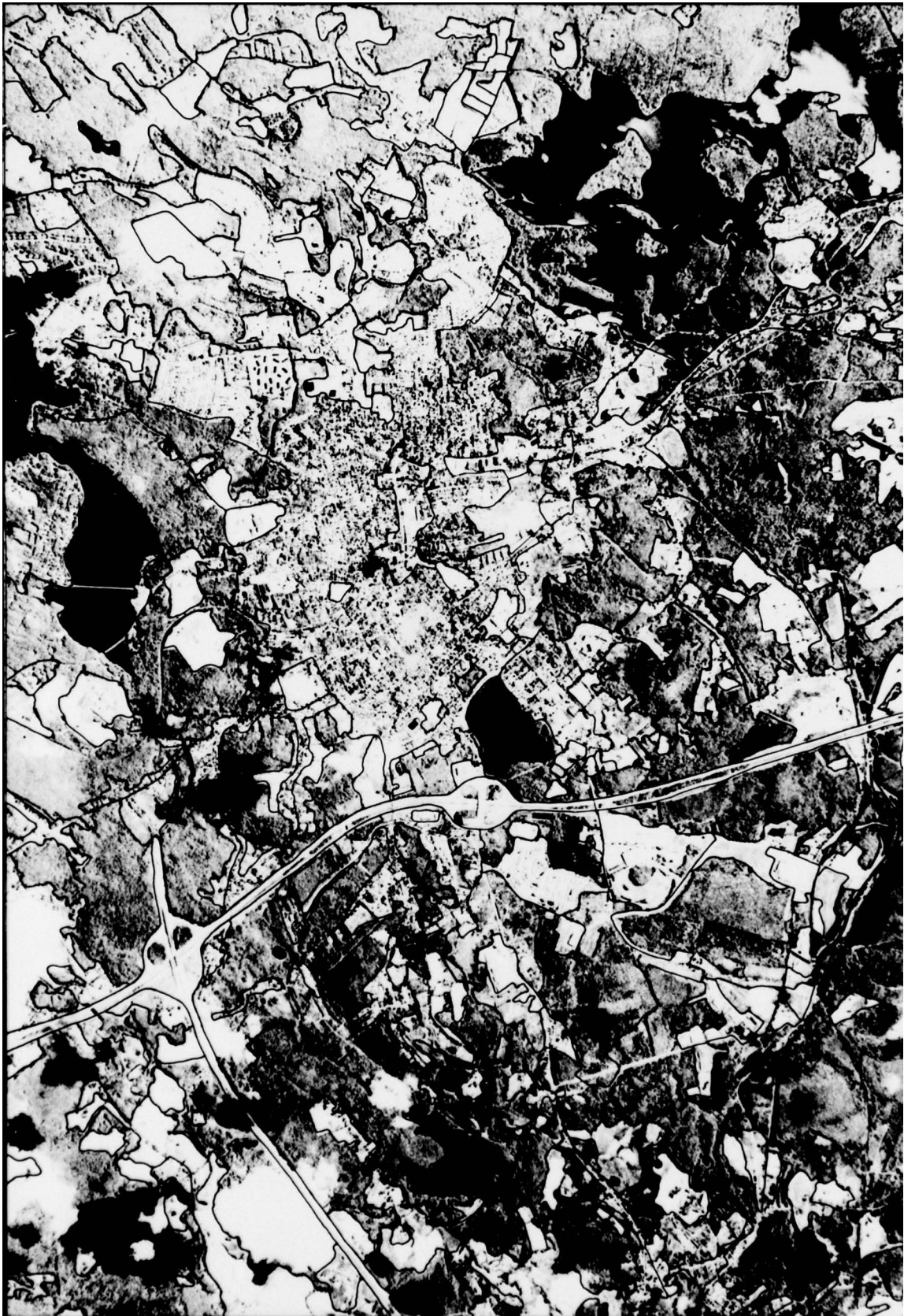
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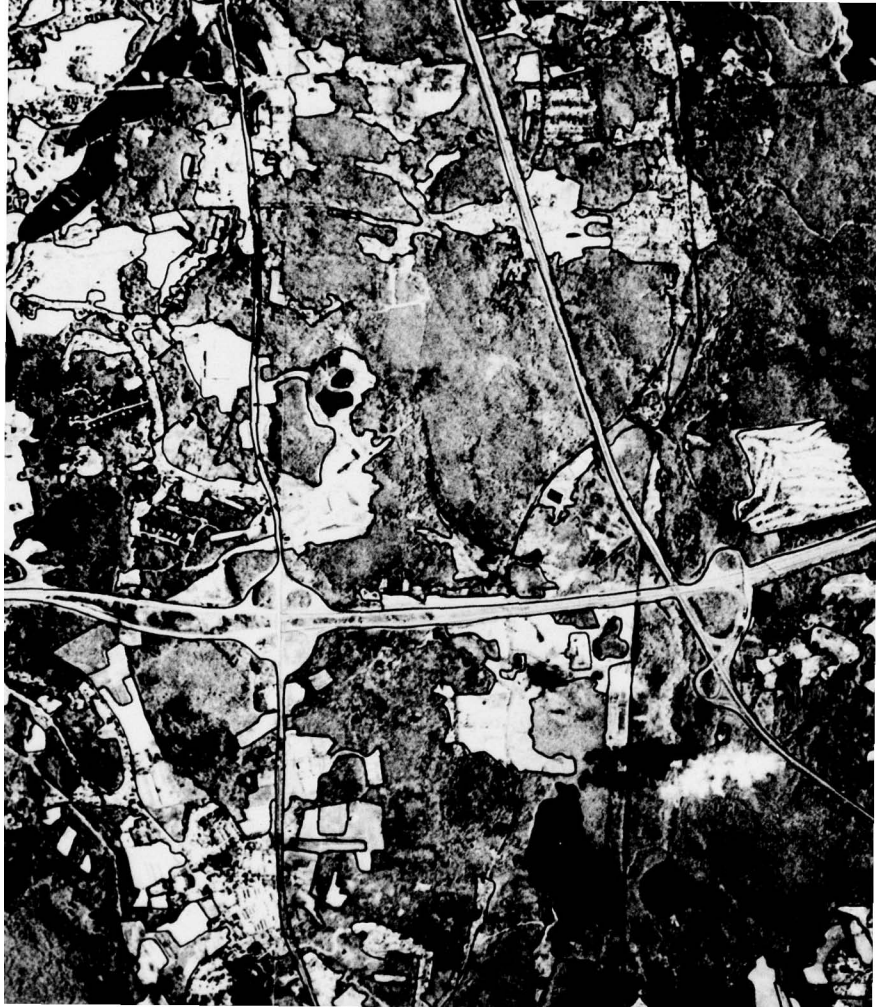
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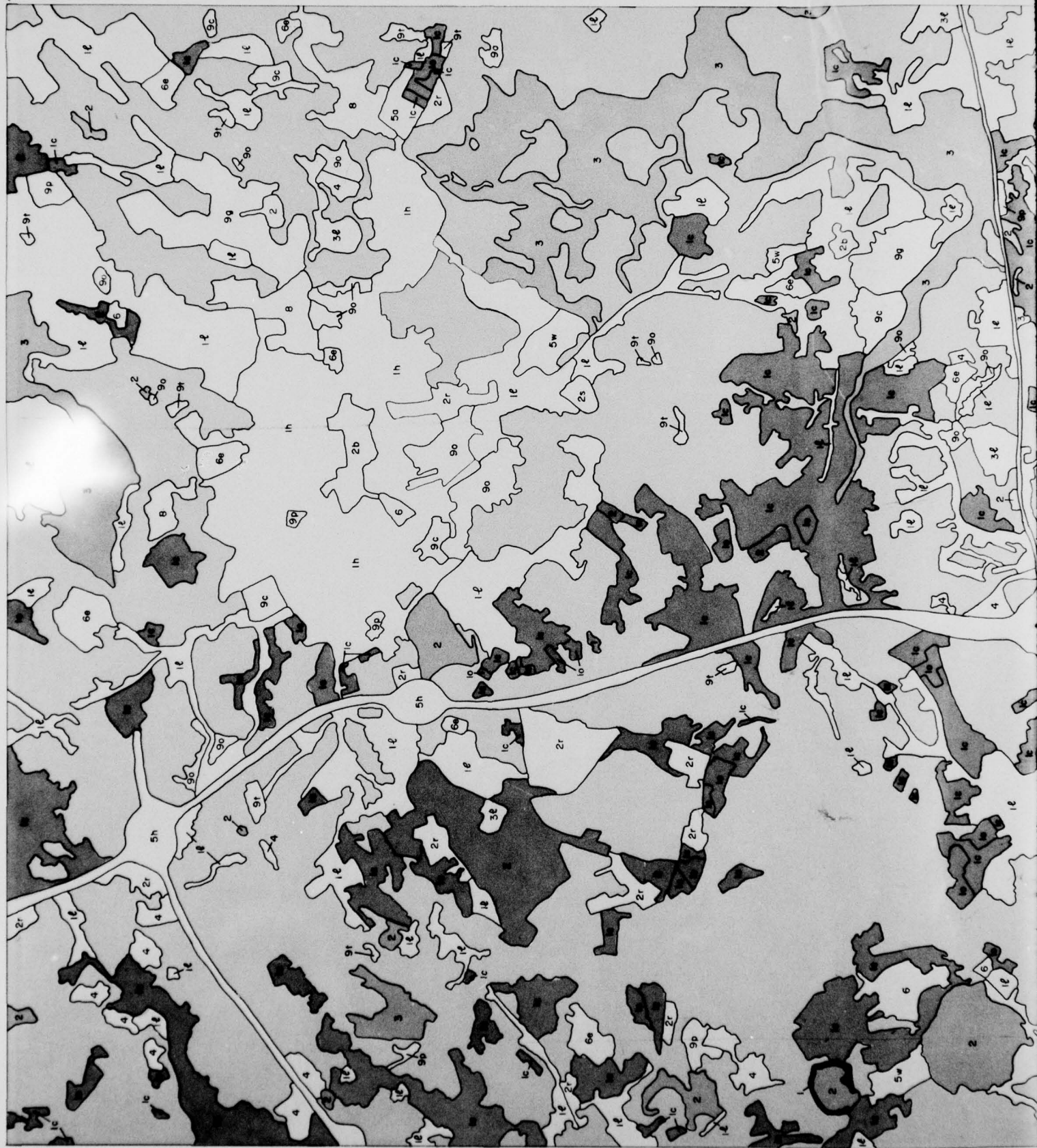
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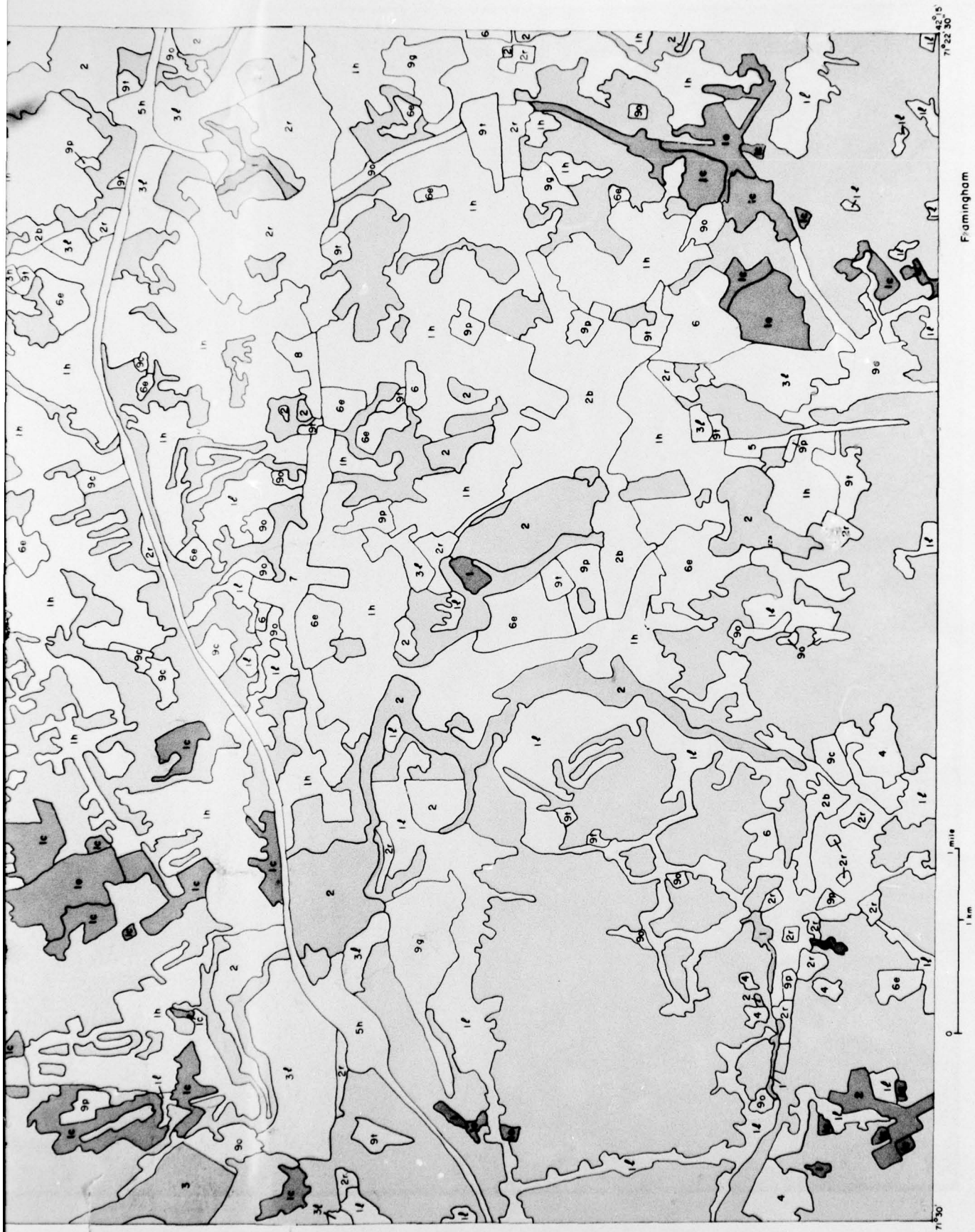






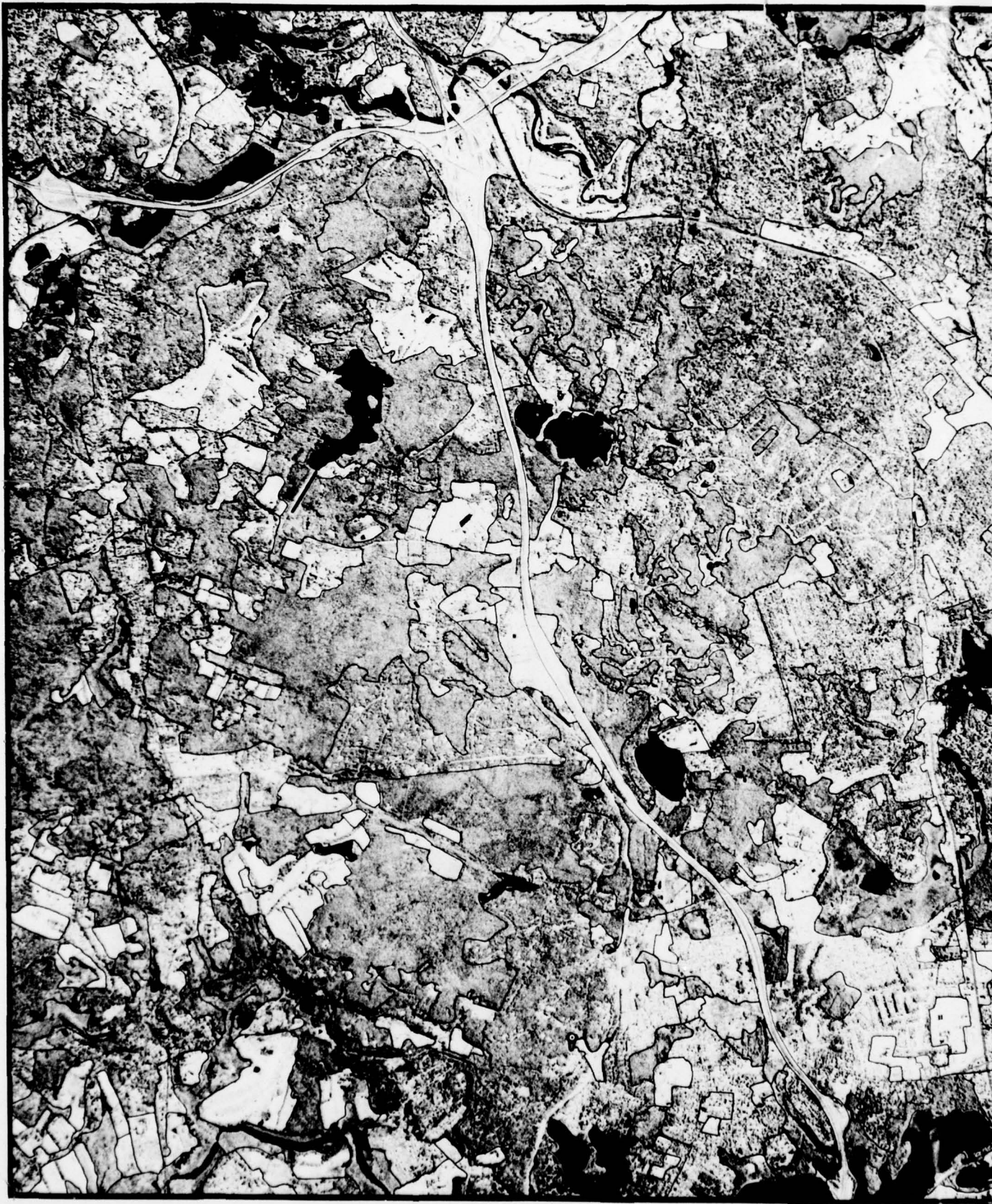






Framingham

Figure A2(b). Land use, Framingham quadrangle.







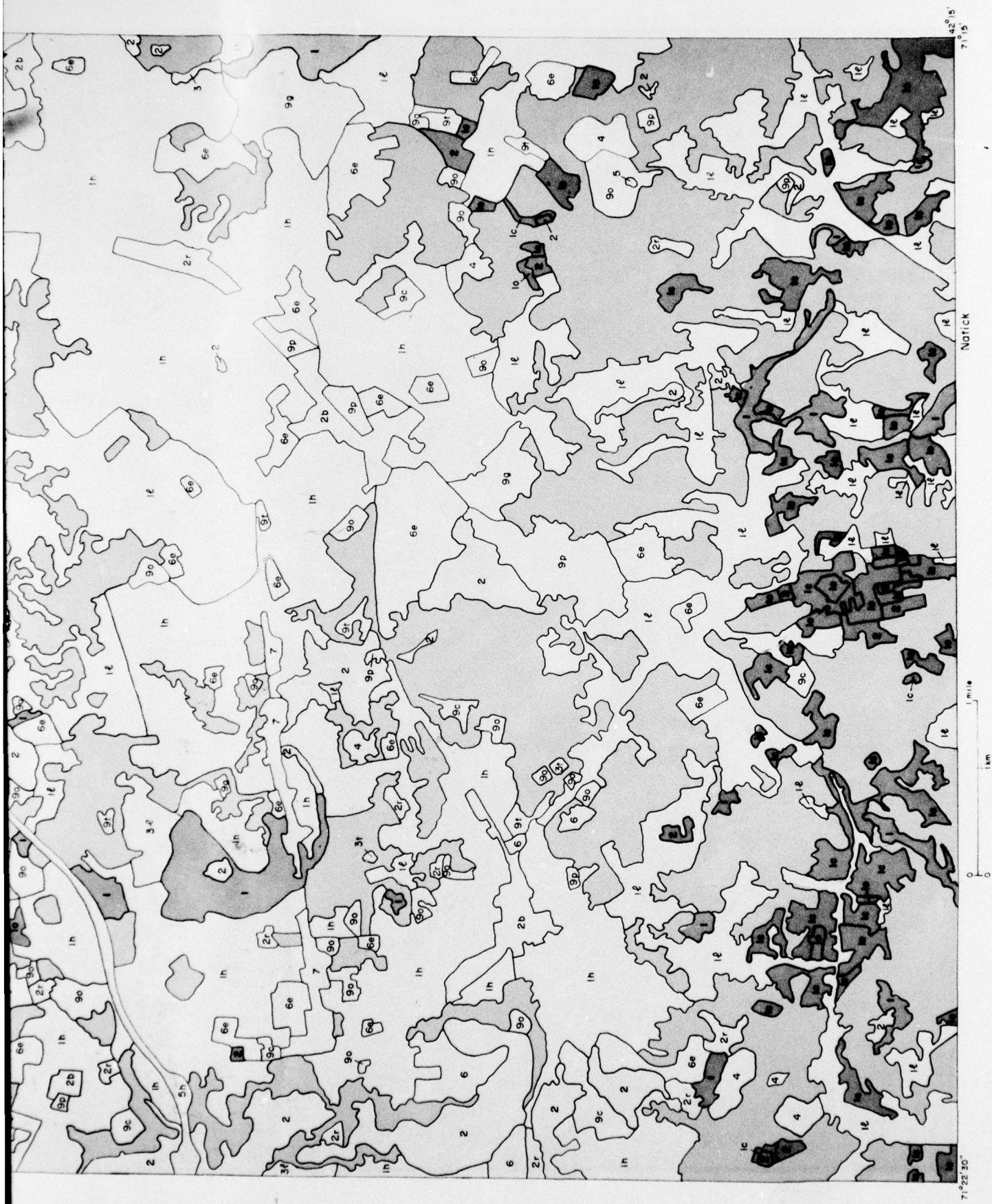
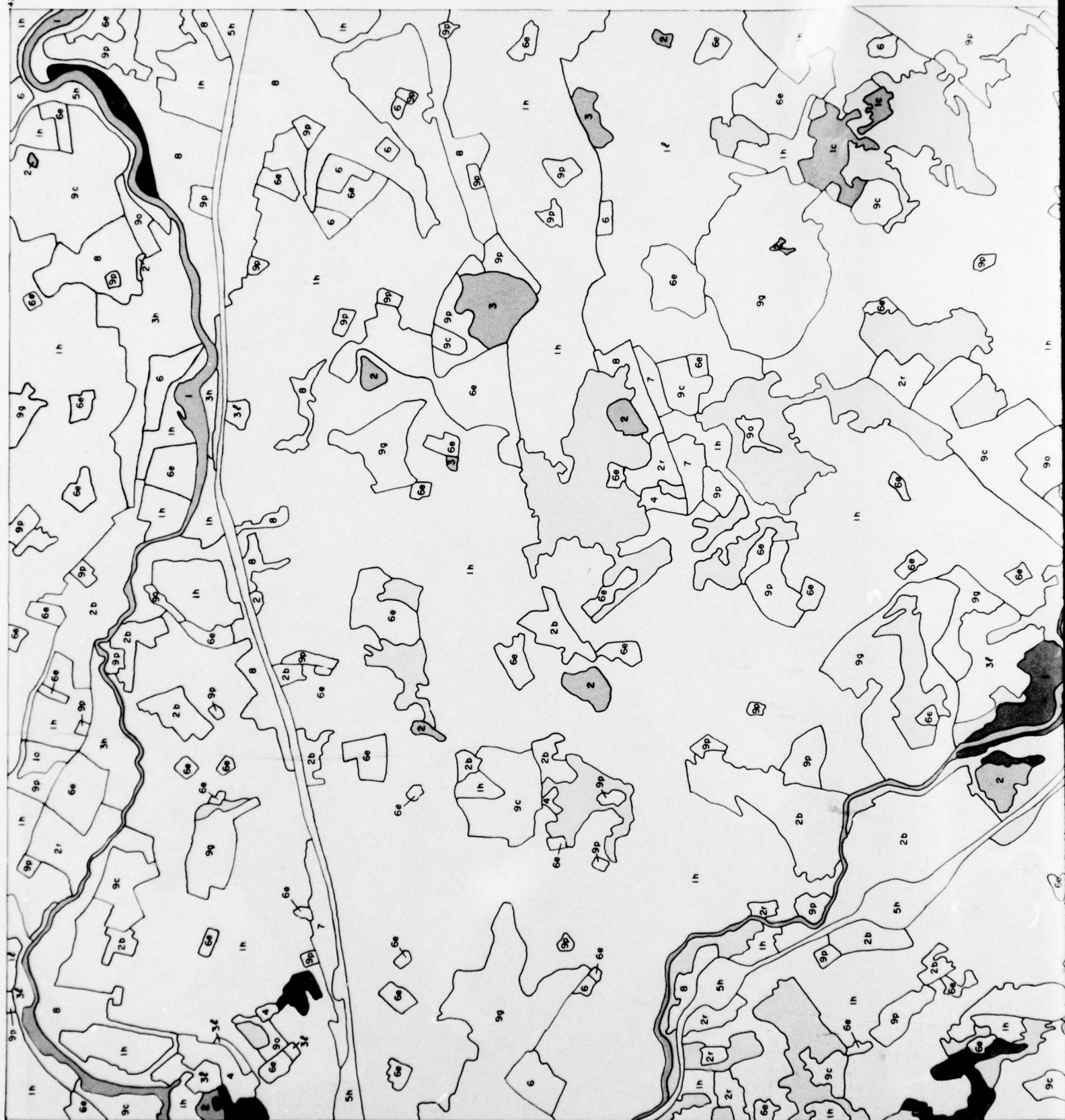


Figure A3(b). Land use, Natick quadrangle.







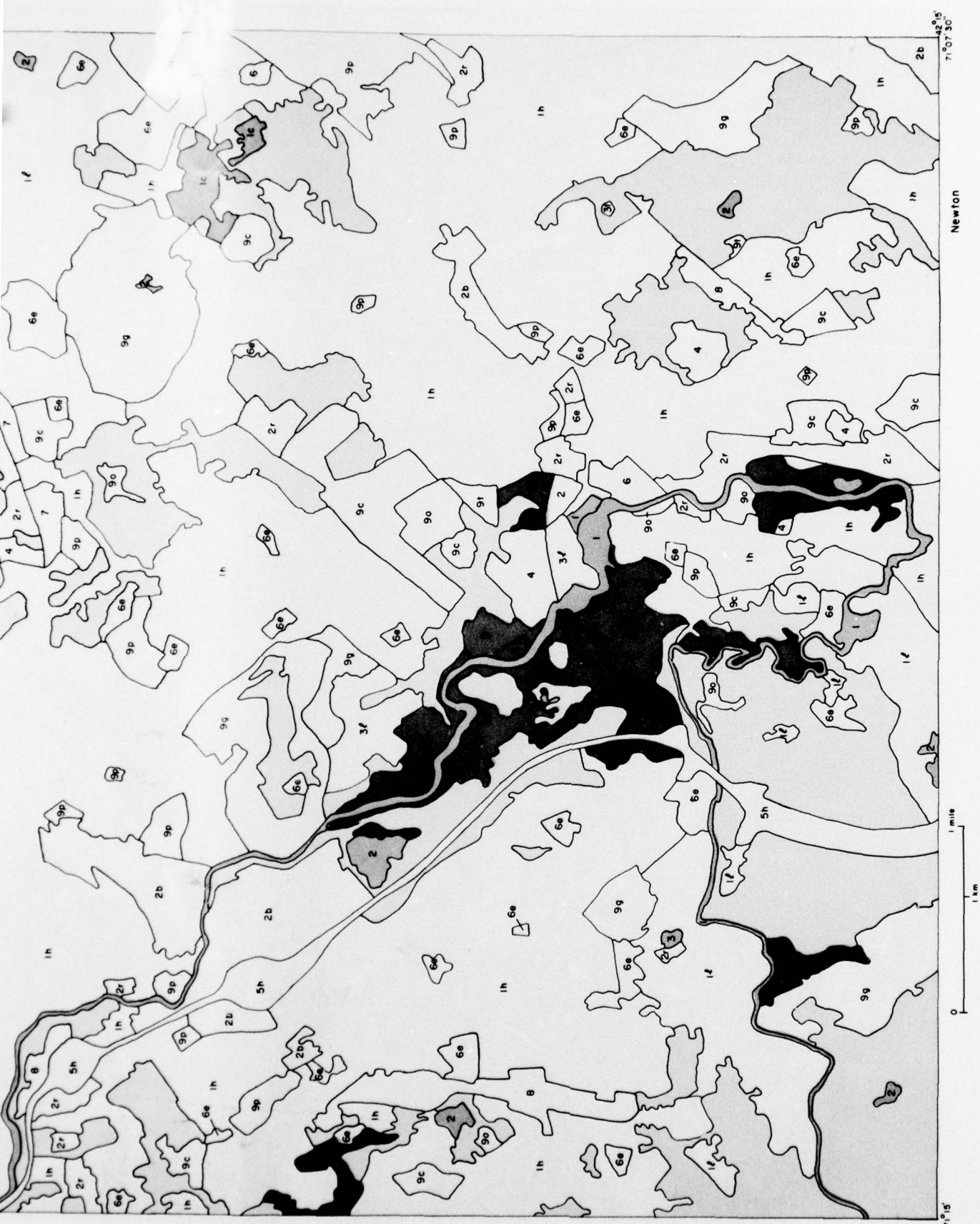


Figure A4(b). Land use, Newton quadrangle.





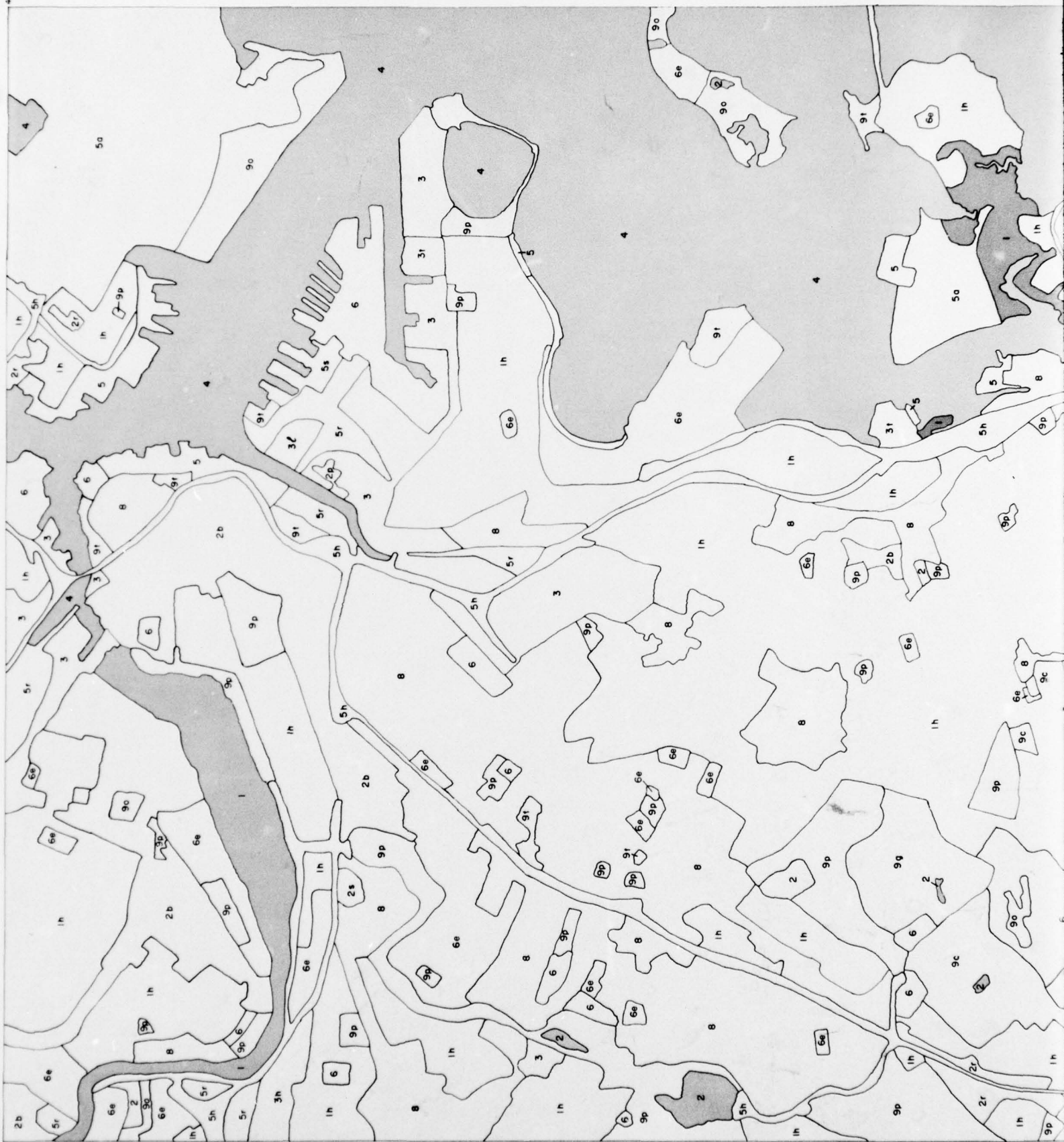
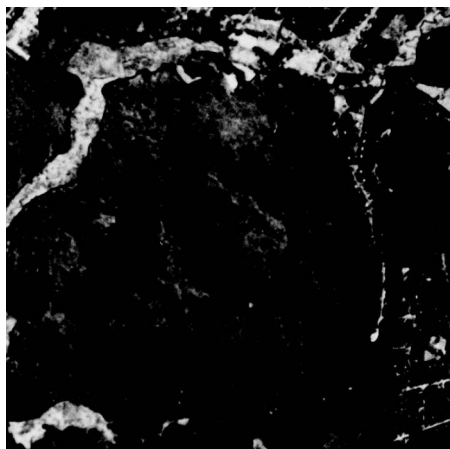
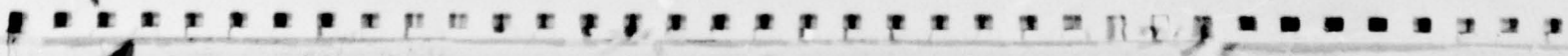
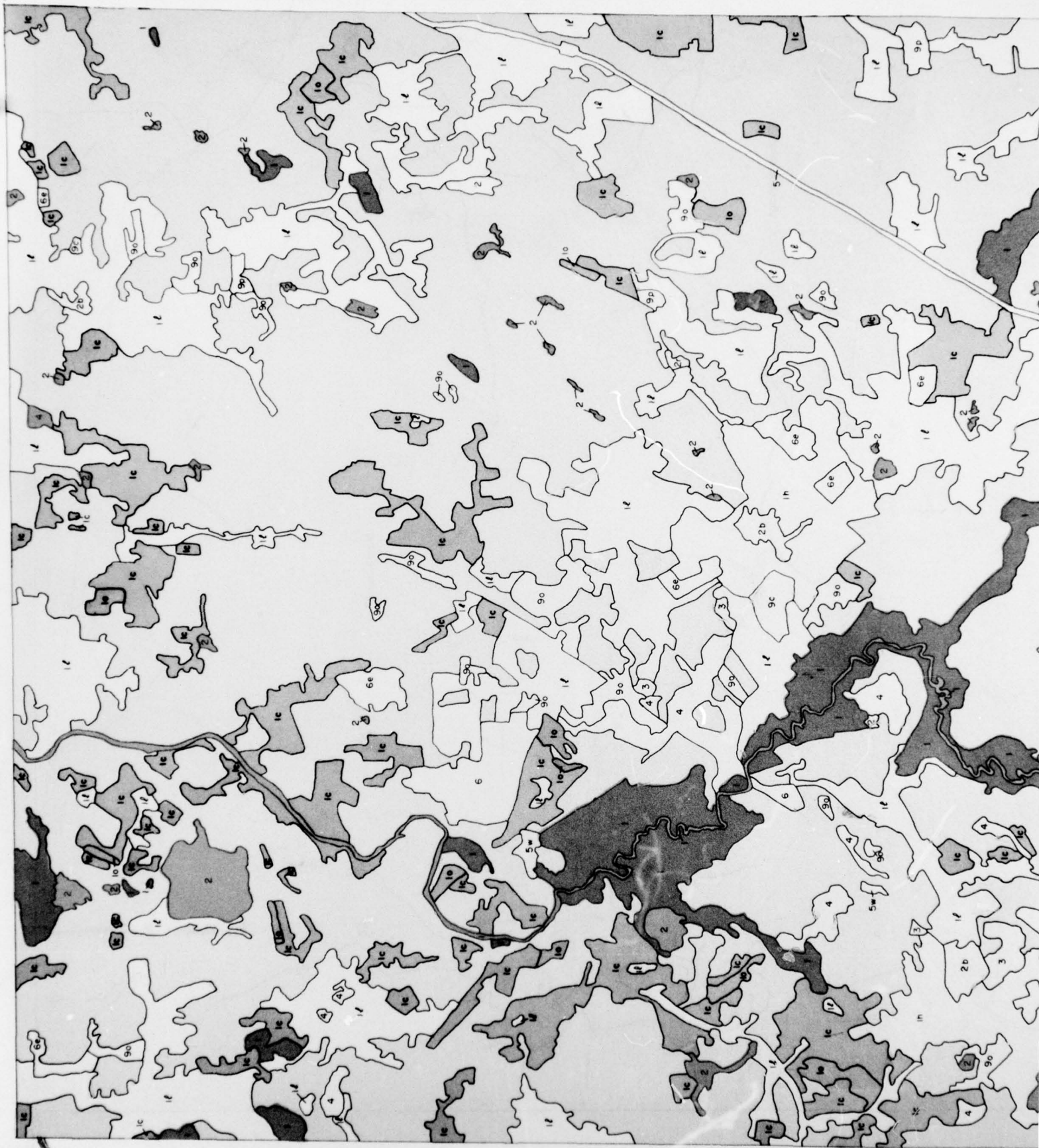




Figure A5(b). Land use, Boston South quadrangle.







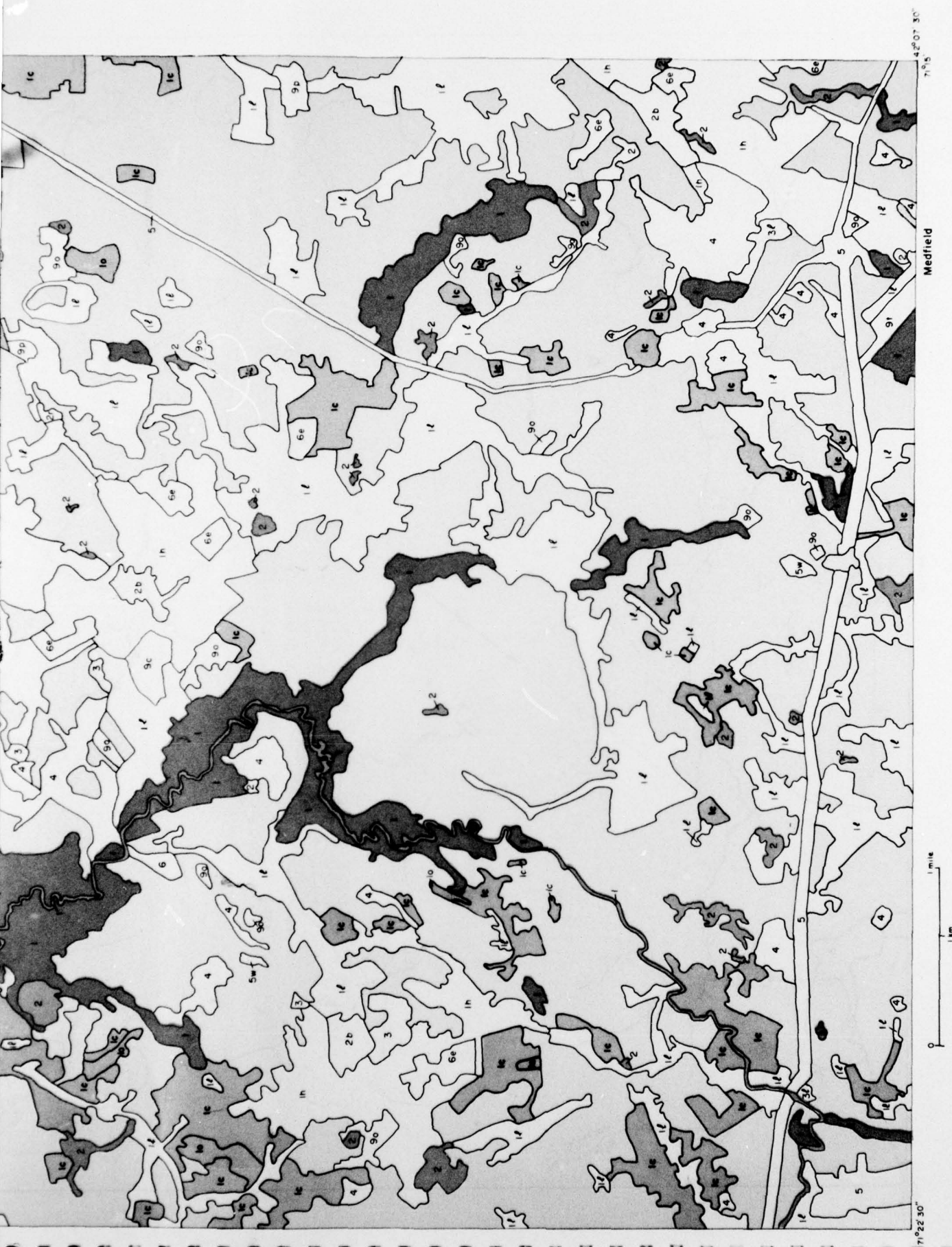
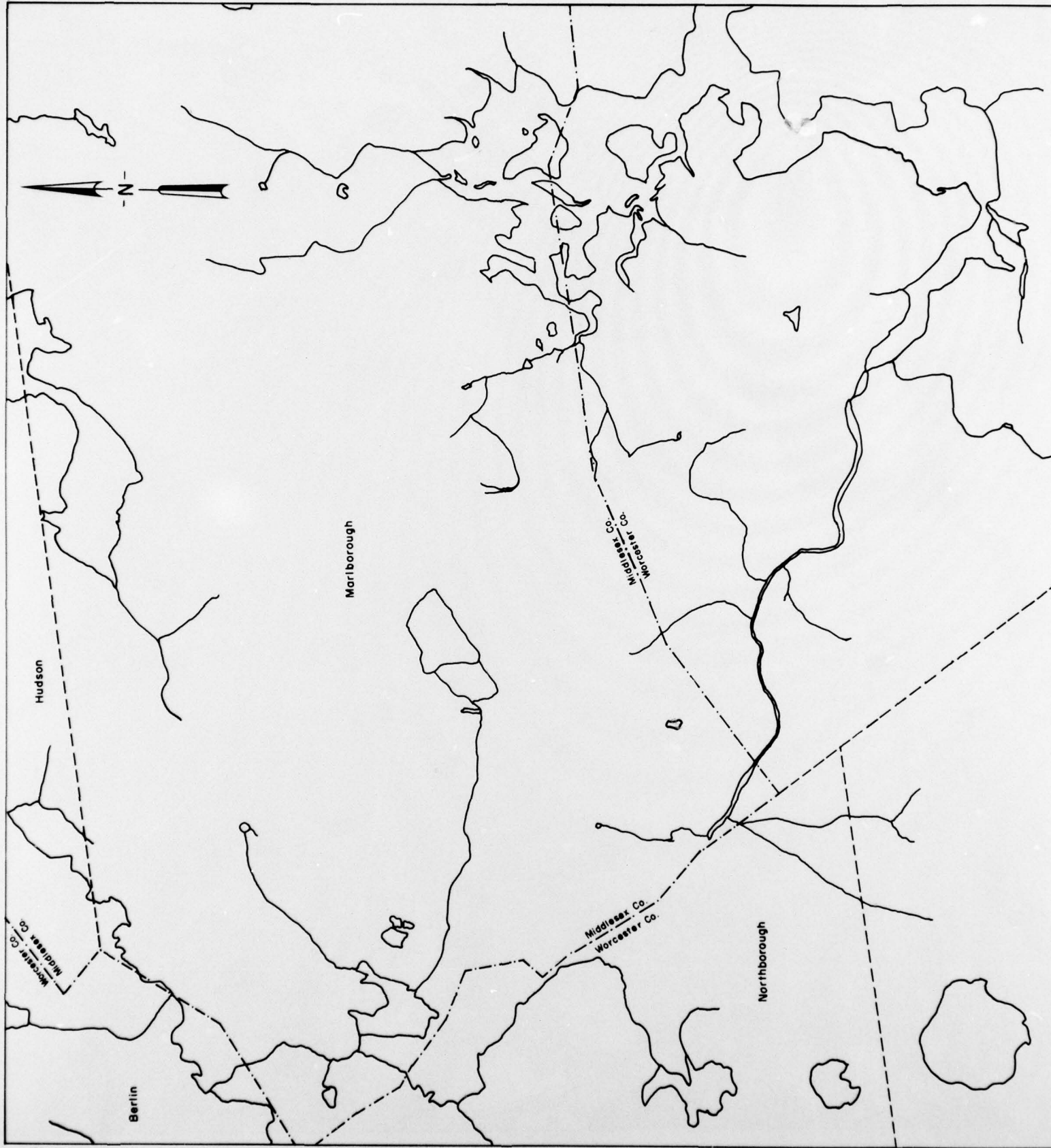


Figure A6(b). Land use, Medfield quadrangle.



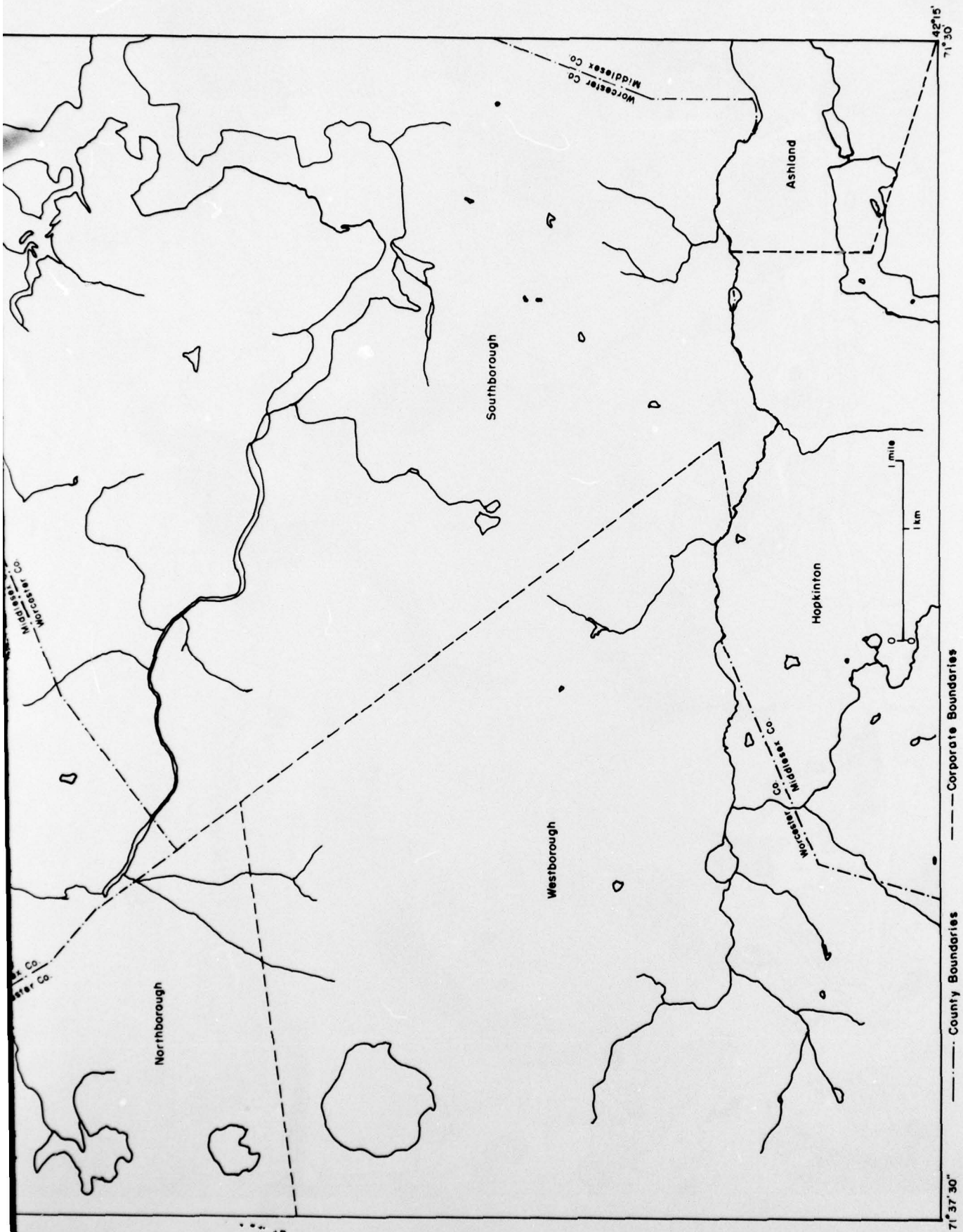
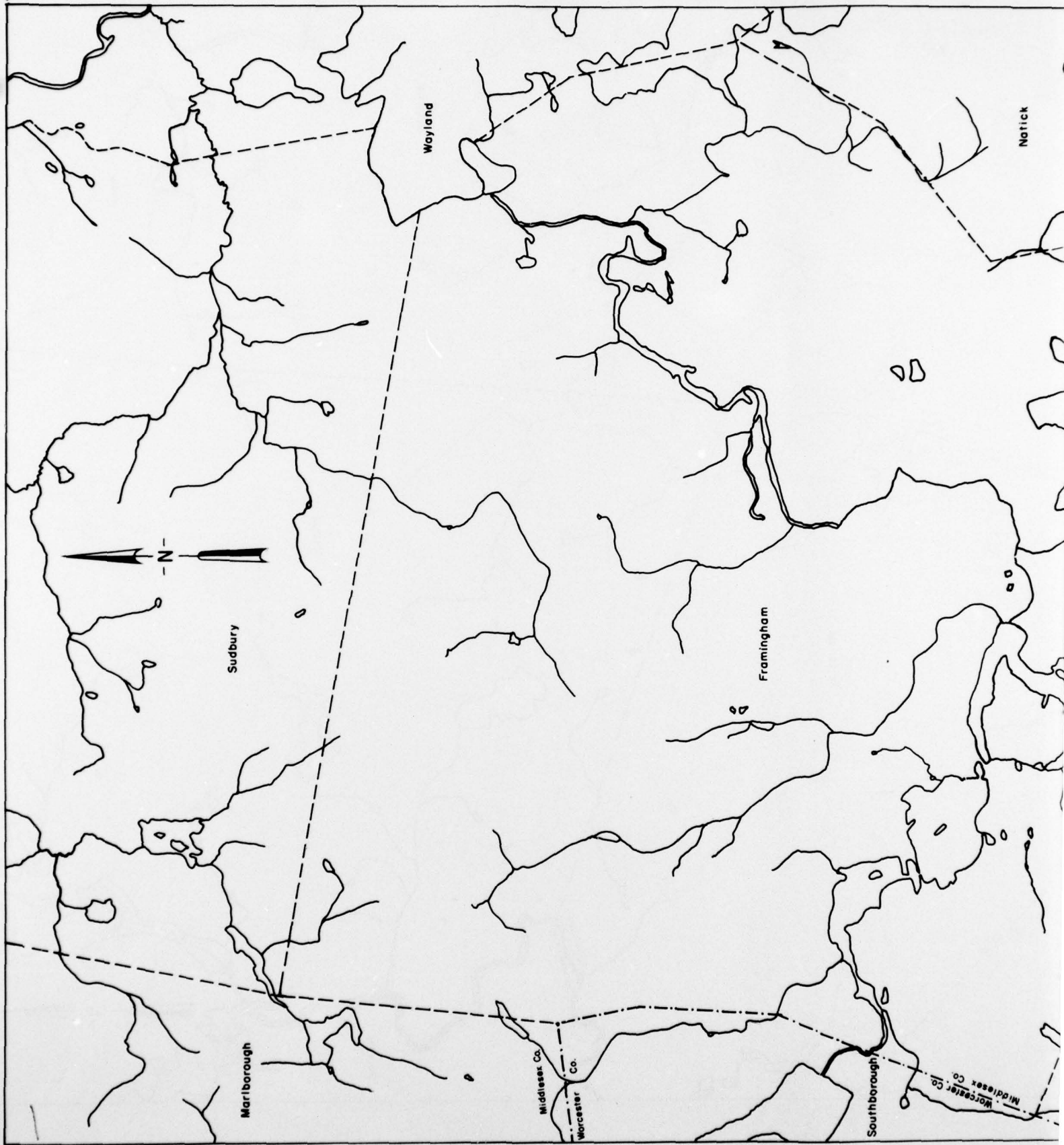


Figure A7. Hydrologic and political boundaries, Marlborough quadrangle.



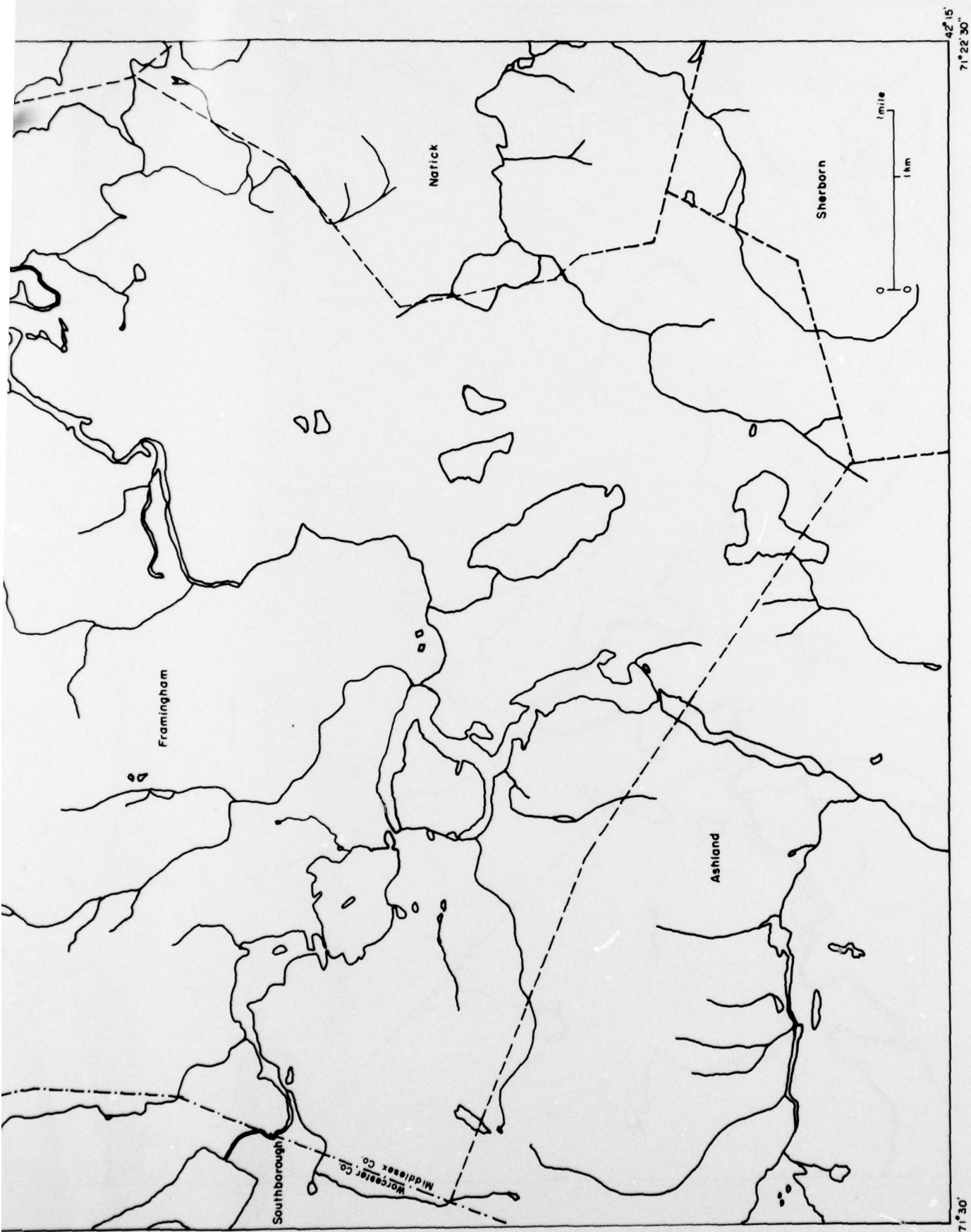
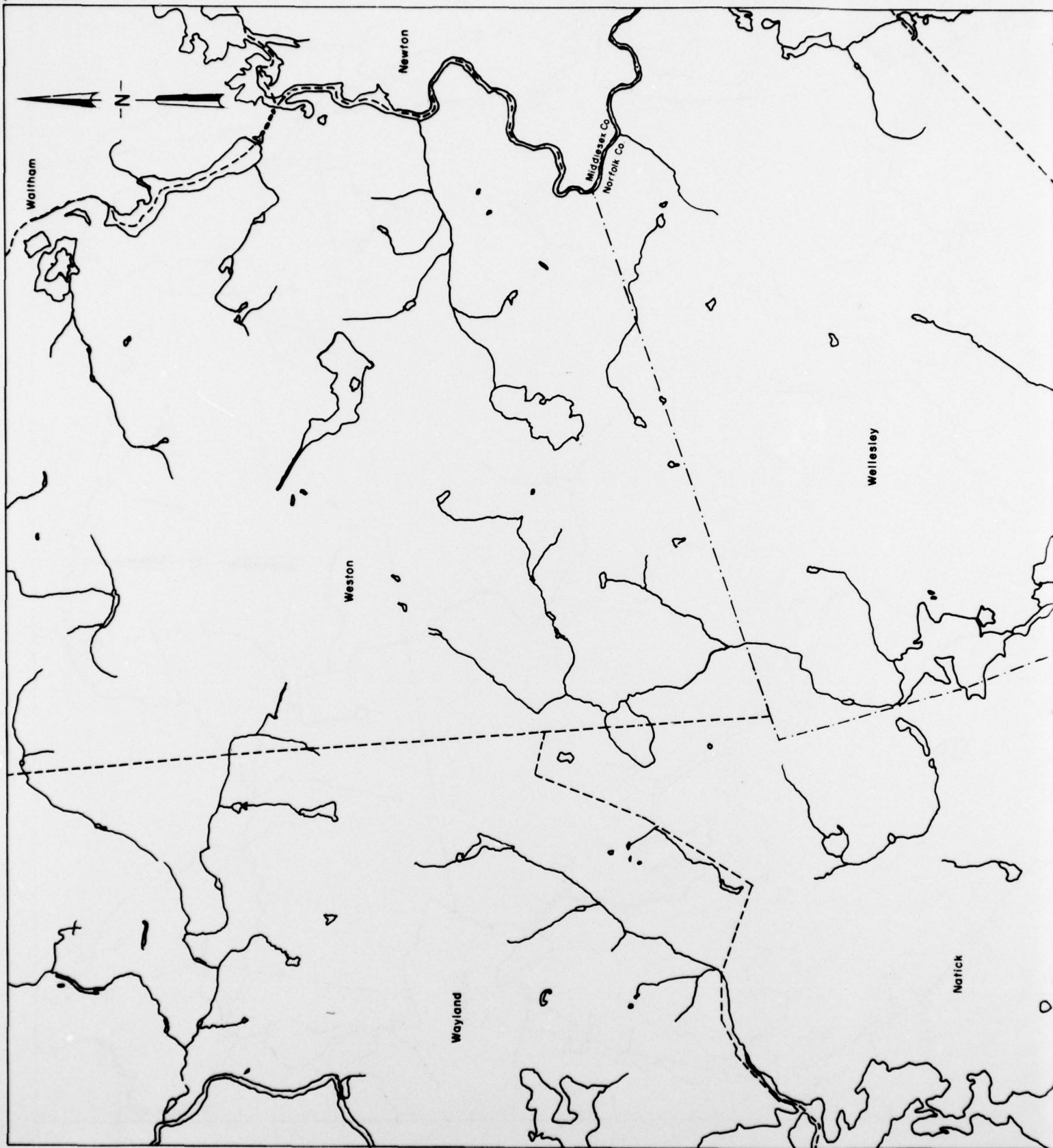


Figure A8. Hydrologic and political boundaries, Framingham quadrangle.



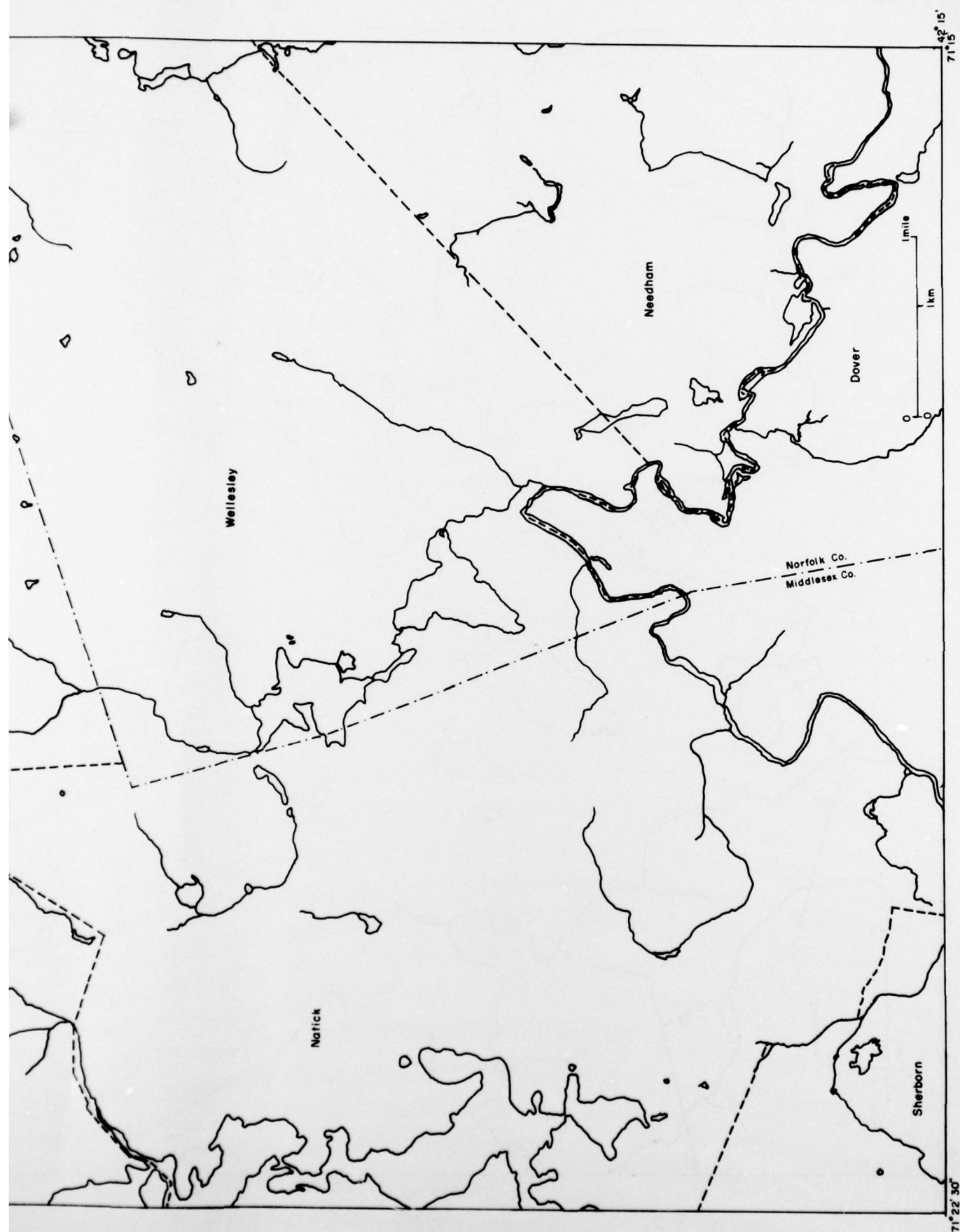
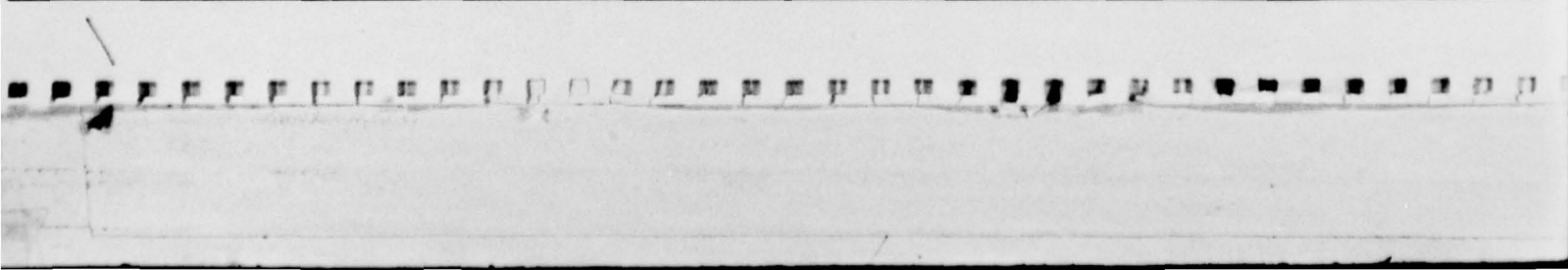
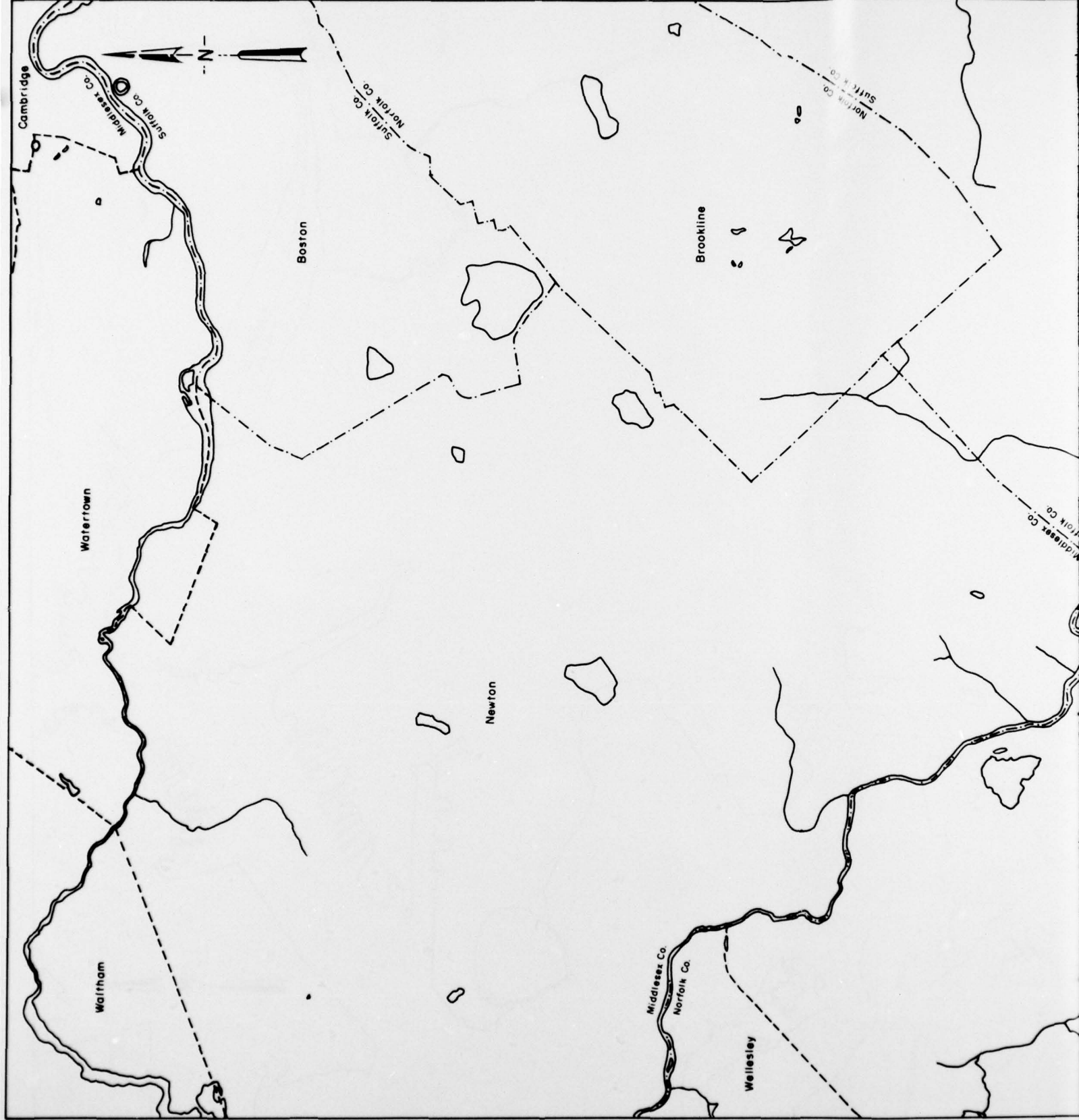


Figure A9. Hydrologic and political boundaries, Natick quadrangle.



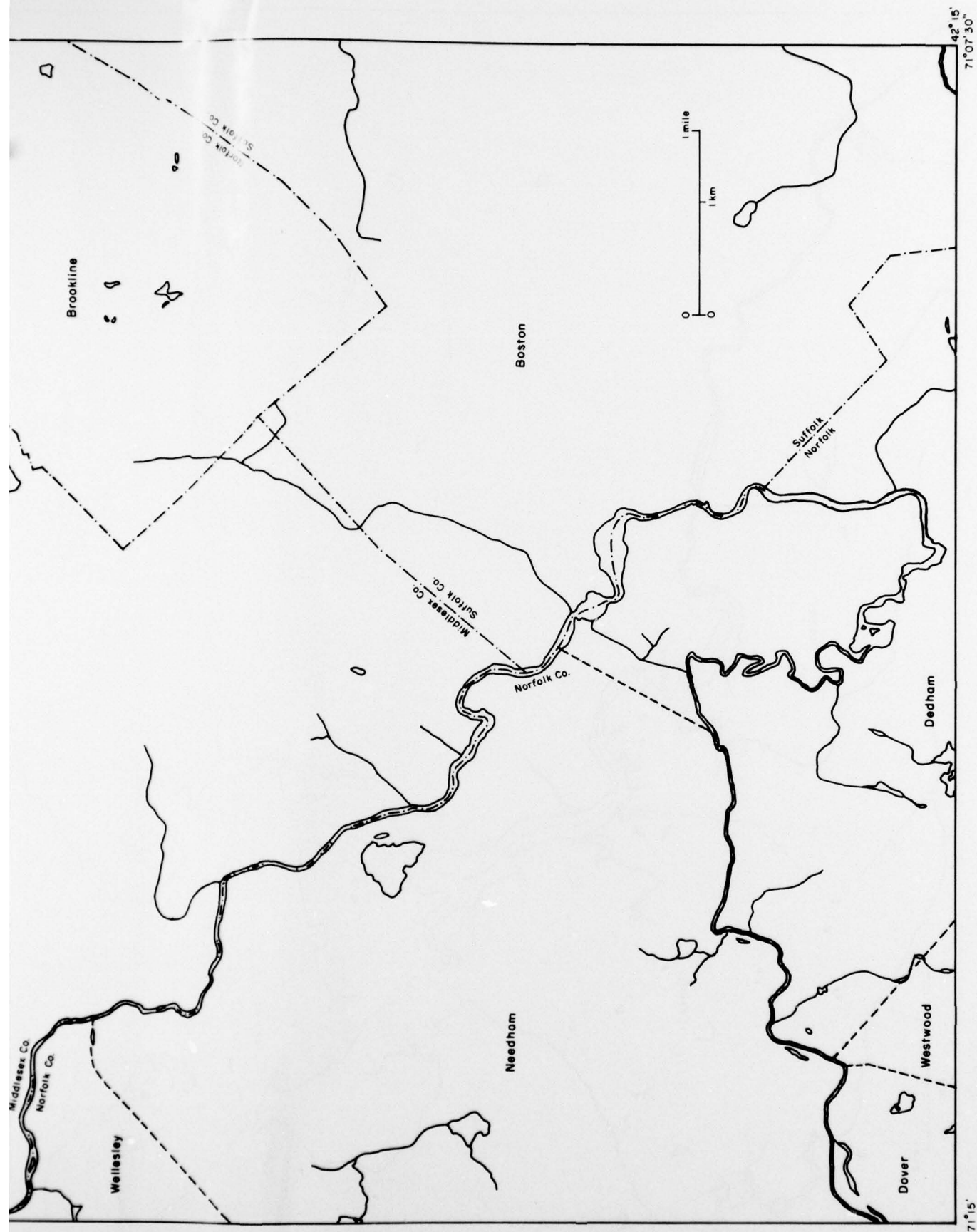
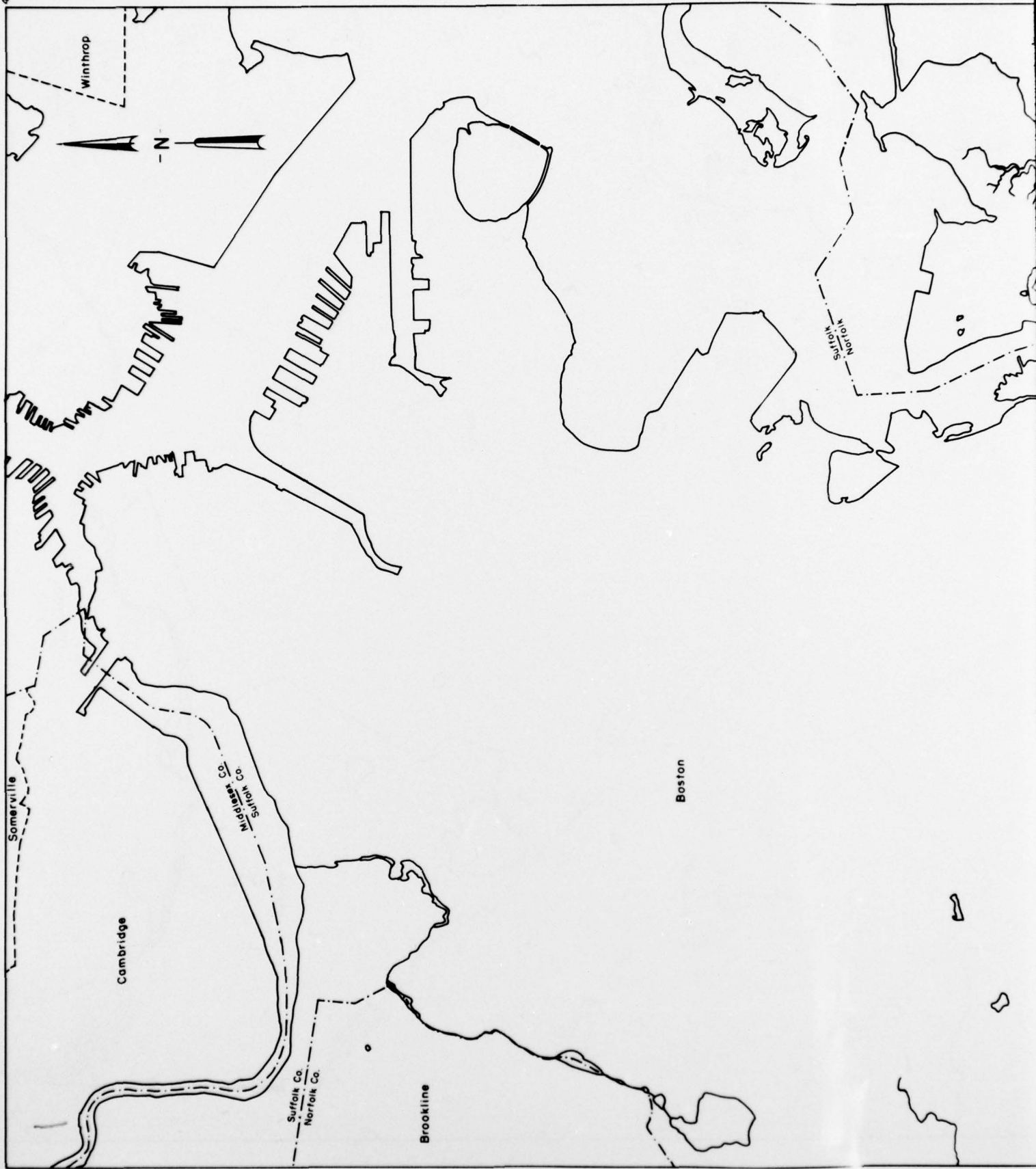


Figure A10. Hydrologic and political boundaries, Newton quadrangle.



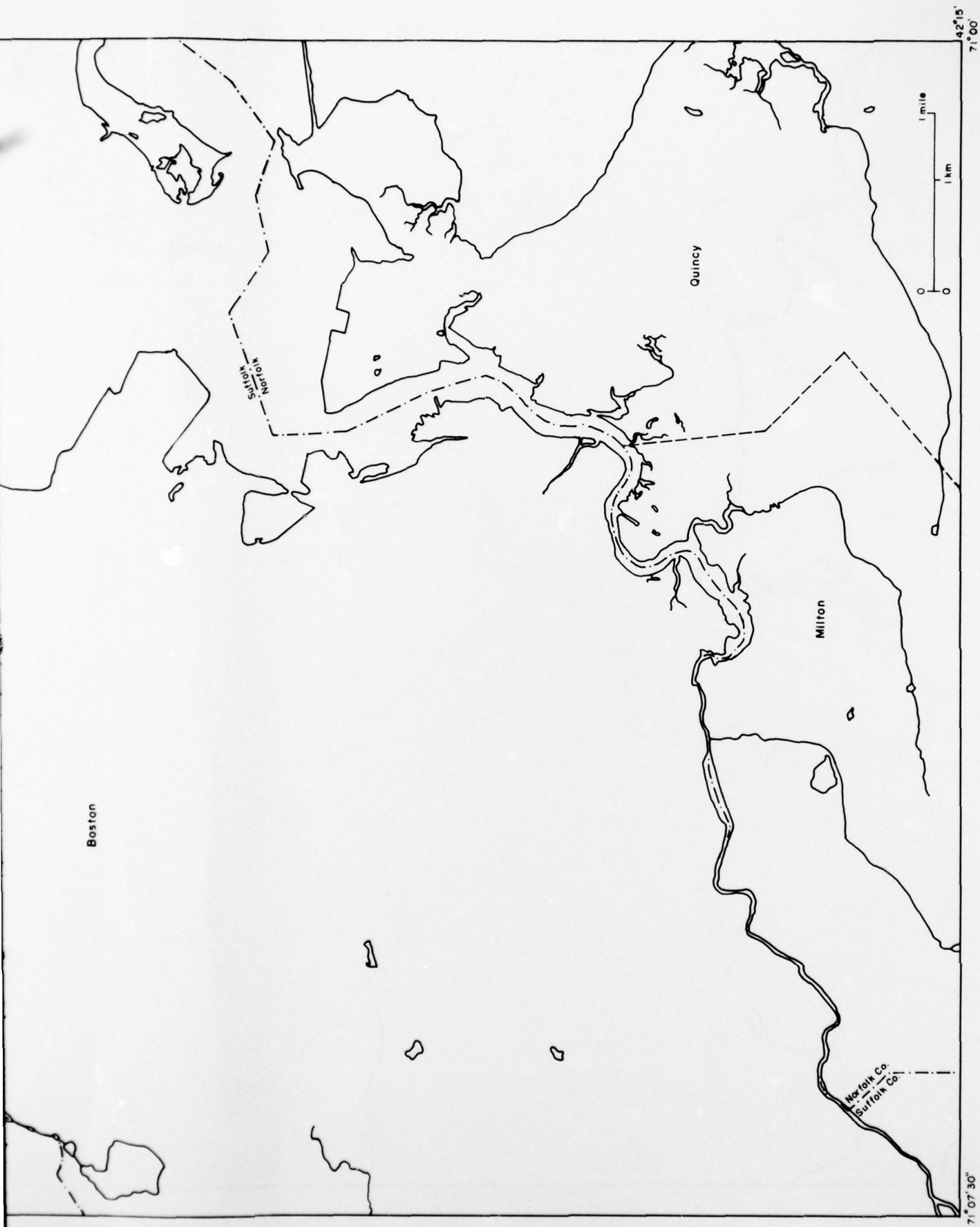
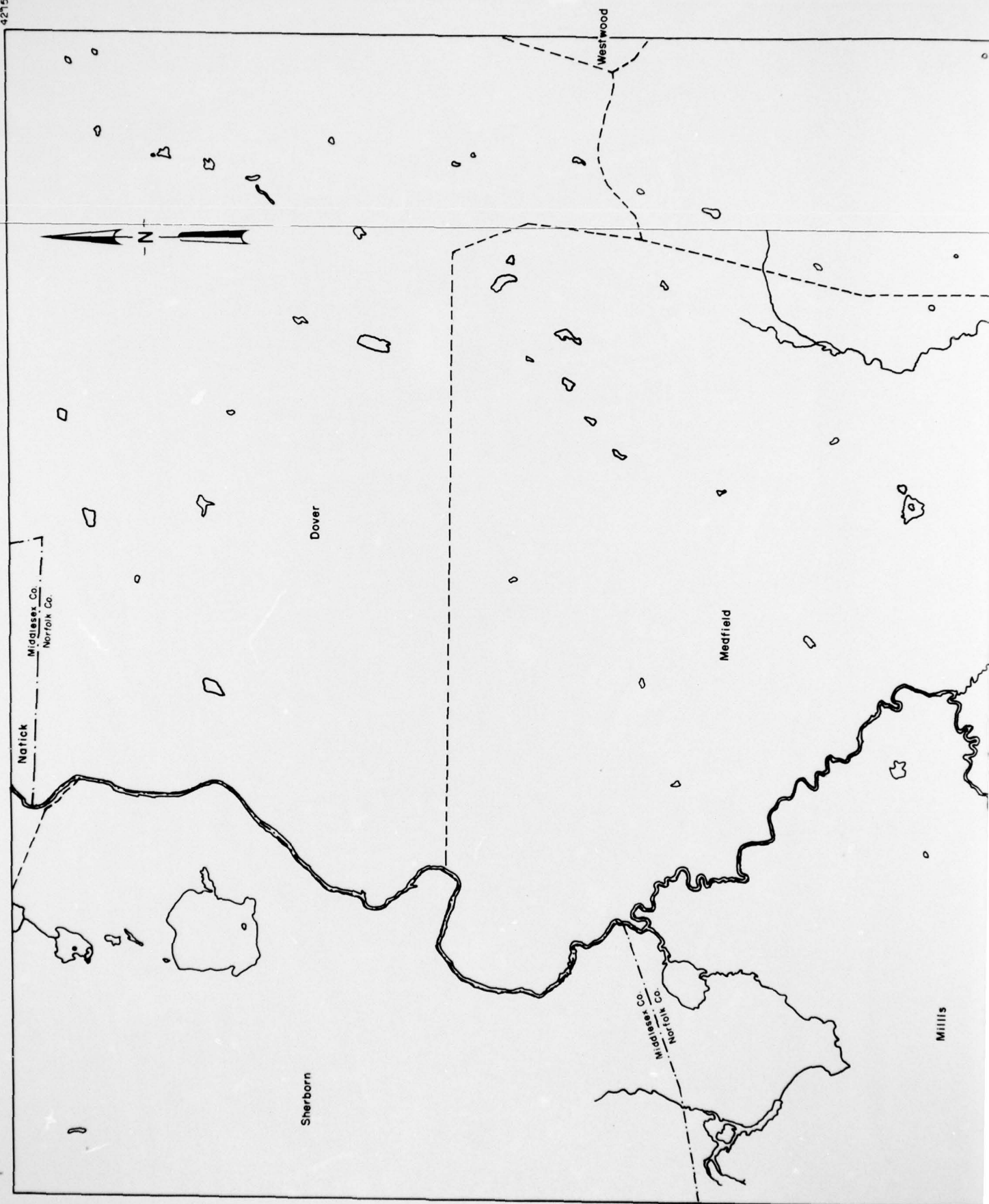


Figure A11. Hydrologic and political boundaries, Boston South quadrangle.



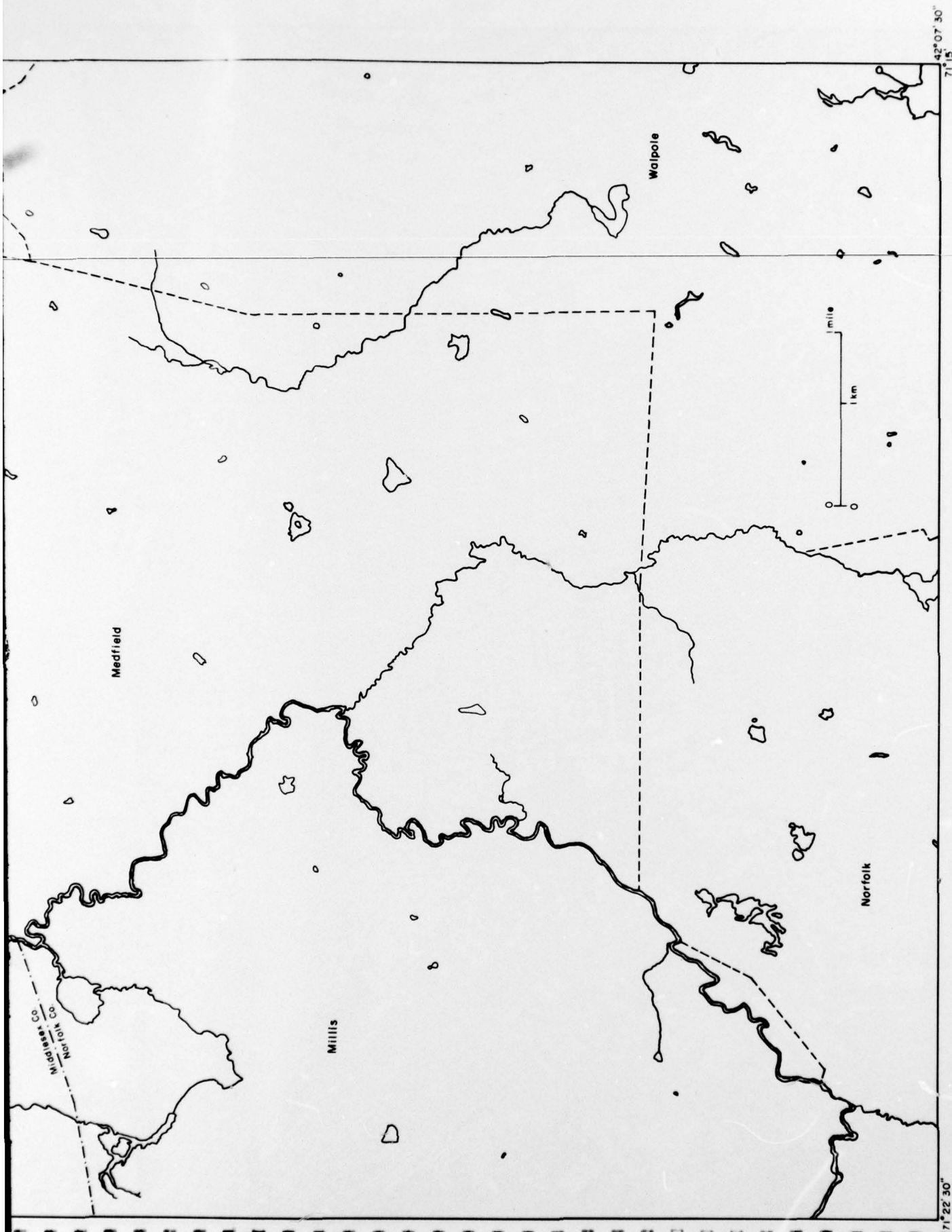


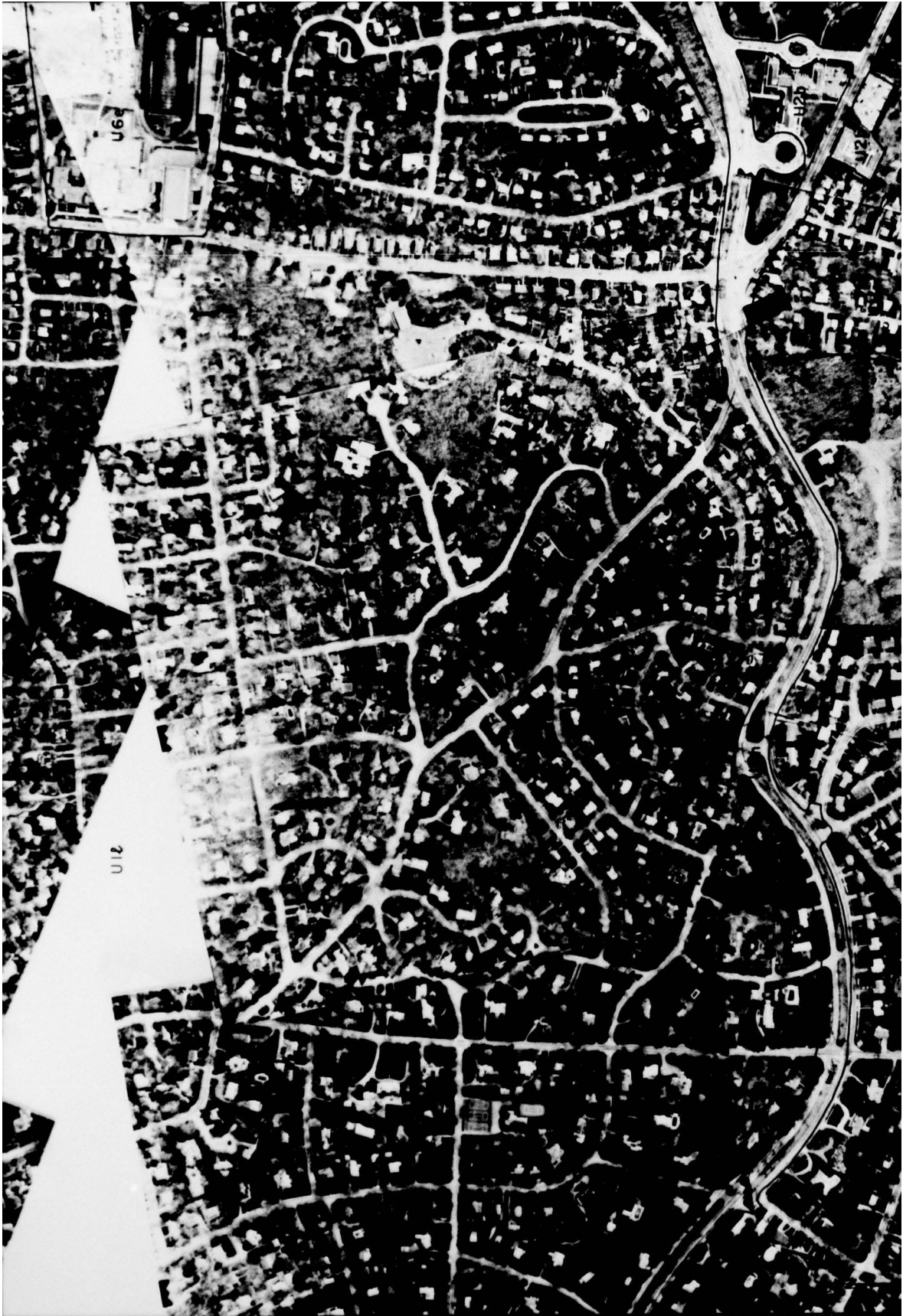
Figure A12. Hydrologic and political boundaries, Medfield quadrangle.











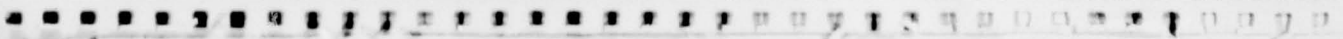




Figure B4. Impervious surfaces, Newton site.





Figure C1. Carb density obtained by photointerpretation, Newton site.











Figure C2. Ground truth map of curb density, Newton site.

Land use classification system (modified from Anderson et al. 1972).

Legend

Appendix A.

Level I	Level II	Level III
 U. Urban and built-up land	1. Residential	h. high density (> 3 families/acre) l. low density (< 3 families/acre)
	2. Commerical and services	b. business, central urban r. retail trade and offices
	3. Industrial	l. light industry t. tank farms
	4. Extractive	
	5. Transportation, communi- cations and utilities	a. airports r. railroads h. limited access highways w. water treatment plants
	6. Institutional	e. educational campuses
	7. Strip and clustered settlement	
	8. Mixed	
	9. Open and other	g. golf courses c. cemeteries t. transitional areas under construction p. parks o. open
 A. Agricultural land	1. Cropland and pasture	o. open, barren c. closed, vegetated
	2. Orchards	
 F. Forest land	1. Mixed	
 W. Water	1. Streams and waterways	
	2. Lakes	
	3. Reservoirs	
	4. Bays and estuaries	
 N. Nonforested wetlands	1. Vegetated	
	2. Bare	
 B. Barren land		